

ABSTRACT OF THE DISCLOSURE

A method for collecting, reprocessing, and recycling chemical species used in the operation of a chemical oxygen-iodine laser system, especially a space-based system, is described. The method primarily includes: (1) collecting an amount of spent basic hydrogen peroxide containing aqueous potassium chloride; (2) converting the aqueous potassium chloride into water, molecular hydrogen, molecular chlorine, and aqueous potassium hydroxide; (3) combining the water and molecular hydrogen with an amount of molecular oxygen from the molecular oxygen source to form aqueous hydrogen peroxide; and (4) mixing the aqueous hydrogen peroxide with the aqueous potassium hydroxide to form basic hydrogen peroxide.